

Remarks

Claims 15, 16 and 21 have been amended to add the feature of a mean pore size of 0.14 – 2.8 μm at both surfaces of the recited film. Support for this amendment may be found in the analysis of the films labeled as Examples A, B and C as set forth in the attached inventor declaration by Shyusei Ohya under 37 C.F.R. § 1.132. The films of Examples A, B and C were prepared as taught by Applicants in the specification at, *inter alia*, paragraphs [0124] to [0212] of the subject application as published.

Claims 15 and 21 have also been amended to clarify the identification of the surfaces of the film recited as not containing a dense layer.

Claim 16 has been amended to clarify that the recited pore size refers to the center of the film.

Accordingly, Applicants believe that no new matter has been introduced by the amendments to claims 15 and 21.

1. Phone Conferences with the Examiner

The undersigned and the Examiner discussed the patentability of the pending claims in telephone conferences on May 12, 2006 and May 19, 2006. In particular, the Examiner requested clarification of the term “side surfaces” as recited in claims 15 and 21. The undersigned agreed to clarify this term in a claim amendment in the next filed response.

2. Inventor Declaration Previously Submitted in Parent Application

In response to the Examiner’s request that a declaration by Yoshihiro Kusuki, which was filed in parent Application No. 09/539,929, now abandoned, be resubmitted as part of the prosecution record of the subject application, Applicants have submitted a copy of the Kusuki declaration herewith.

3. **Rejection under 35 U.S.C. § 112, second paragraph**

Claims 15-27 are rejected as being indefinite because the Examiner asserts that the recited term “side surface” in claims 15 and 21 allegedly has insufficient antecedent basis.

Applicants have amended claims 15 and 21 to delete the term “side surface” and replace it with “either of the surfaces” which Applicants believe has adequate antecedent basis.

Accordingly, Applicants request that this rejection be withdrawn.

4. **Rejection under 35 U.S.C. § 102(b) or § 103(a) in view of the ‘856 patent**

The Examiner maintains the rejection of claims 15-24 and 26 as allegedly anticipated by, or obvious over, JP 2-2856 (“the ‘856 patent”). The Examiner acknowledges that the ‘856 patent does not disclose a film having (i) fine continuous channels reaching to both surfaces in a non-linear fashion or (ii) Applicants’ claimed porosity, air resistance, heat resistance, heat shrinkage or dielectric constant. However, the Examiner considers these properties to be inherent in the films taught by the ‘856 patent. Specifically, the Examiner cites to a complete English-language translation of the ‘856 patent that allegedly shows that a film with a dense layer is only a preferred embodiment of the described invention. The Examiner cites pages 9 to 11 of the English translation as evidence of a film that, in the Examiner’s words, is “fabricated by a casting method that is basically the same as a third method of the present invention which is intended to produce a porous insulating film without a dense layer.”

Applicants respectfully disagree with this rejection for at least the following reason. The third method of Applicants’ invention is clearly different from the vapor solidification method described in the above-cited section from the ‘856 patent. In Applicants’ invention, the cast film is contacted with a solidifying solvent to form pores after exposure to the vapor of a non-solvent for the polyimide precursor (see, *e.g.*, page 8, lines 17-26 and page 16, line 32 to page 17, line 3).

In contrast, in the described vapor solidification method of the ‘856 patent, there is no step in which the film is contacted with a solidifying solvent. The film that results from the teaching of the ‘856 patent is obtained immediately after exposure to the vapor of a non-solvent for the polymer. Because the preparation of the described films of the ‘856 patent does not

include a step in which the film is contacted with a solidifying agent, the resulting films will contain a dense layer. Exemplary support for this submission by Applicants may be found in the described examples of the '856 patent, wherein each of the prepared films contain a dense layer.

Further, as submitted by Applicants in the previously filed response, a reading of the '856 patent as a whole makes it clear that a dense layer will be present on the surface of the described films. Applicants brought to the Examiner's attention selected sections of a partial English-language translation of the '856 patent that supported this statement. Applicants now point out the same supporting sections in the complete English-language translation provided by the Examiner. For example, the stated purpose of the '856 patent is the development of a porous membrane "bearing excellent mechanical properties..." (see page 4, lines 19-23). Regarding how such mechanical properties are achieved, the specification of the '856 patent clearly states

"...the mechanical strengths become improved as the thickness of the dense layer becomes enlarged, whereas the water flux value increases as said thickness becomes reduced, and therefore, an appropriate thickness is selected depending on applications, although it is normally desirable for the thickness to be confined, in consideration of the balance of both factors, to a range of 0.1 ~ 20 μm , preferably 0.5 ~ 5 μm " (page 6, lines 21-26).

Applicants submit that the above language, coupled with the stated purpose of the invention (*i.e.*, a film having excellent mechanical property), indicates that a dense layer is required and that only the thickness of the dense layer is variable, depending on the particular application envisioned.

Because the '856 patent does not either teach or suggest the preparation of films lacking a dense layer, the '856 patent cannot anticipate or render obvious Applicants' claimed invention. For at least this reason, Applicants request that these § 102(b) and § 103(a) rejections be withdrawn.

5. Rejection under 35 U.S.C. § 103(a) over the ‘856 patent in view of Dorval

The Examiner also maintains her rejection of claims 25 and 27 as allegedly being unpatentable over the ‘856 patent in view of U.S. Patent 5,547,833 to Dorval *et al.* (“Dorval”). The Examiner acknowledges that the ‘856 patent does not teach that the pores are arranged substantially parallel to the film’s surface, but cites Dorval for this teaching.

Applicants respectfully disagree with the Examiner’s continued rejection of these claims as allegedly obvious over the ‘856 patent in view of Dorval. As stated in section 4 above, the ‘856 patent neither teaches nor suggests Applicants’ claimed porous insulating film that lacks a dense layer. Dorval is unable to remedy this deficiency. Accordingly, at least for this reason, the combination of the ‘856 patent and Dorval cannot render obvious Applicants’ claims 25 and 27. Therefore, Applicants respectfully request that this rejection be withdrawn.

6. Rejection under 35 U.S.C. § 102(b) or § 103(a) in view of O’Neill

Claims 15-20 and 25 are rejected as allegedly anticipated by, or obvious over, U.S. Patent 6,187,248 to O’Neill *et al.* (“O’Neill”). The Examiner asserts that O’Neill allegedly teaches a nanoporous polyimide film with a thickness, pore size and dielectric constant claimed by Applicants. The Examiner also asserts that O’Neill allegedly teaches a film casting method that is similar to Applicants’ third method as disclosed in the subject application. Although the Examiner acknowledges that O’Neill does not disclose Applicants’ claimed heat shrinkage, gas permeability or continuous pore structure, the Examiner asserts that these physical characteristics would be inherently present.

Applicants respectfully disagree with this rejection for at least the reason that claim 15, as amended, requires a minimal pore size of 0.14 μm at the surfaces of the film, which is significantly larger than the pore size of less than 30 nm (*i.e.*, 0.03 μm) taught by O’Neill. O’Neill doesn’t explicitly address whether this measured pore size occurs in the interior or at the surfaces of the prepared films. However, O’Neill does describe its films as being transparent and having an isotropic pore structure (see, *e.g.*, col. 9, lines 25-29). In view of the fact that the films are transparent, mirror scattering would occur on the surfaces of the O’Neill films, meaning that

the pore size at these surfaces would be significantly smaller than Applicant's minimal claimed pore size of 0.14 μm . Accordingly, O'Neill cannot anticipate or render obvious Applicants' claim 15 as amended or the claims dependent on claim 15. Therefore, Applicants request that these § 102(b) and § 103(a) rejections be withdrawn.

7. Rejection under 35 U.S.C. § 103(a) over O'Neill in view of Jasne

Claims 21-24, 26 and 27 are rejected as allegedly being unpatentable over O'Neill in view of U.S. Patent 5,153,303 to Jasne *et al.* ("Jasne"). The Examiner acknowledges that O'Neill does not teach a polyimide formed from a biphenyltetracarboxylic acid and paraphenylene diamine, but cites Jasne for this teaching.

Applicants respectfully disagree with this rejection at least for the following reason. As stated in section 6 above, O'Neill neither teaches nor suggests Applicants' claimed porous insulating film having a mean pore size of 0.14 – 2.8 μm at the surfaces of the film. Jasne is unable to remedy this deficiency. Accordingly, Applicants respectfully request that this rejection be withdrawn.

8. Double Patenting Rejection

Claims 15-27 are provisionally rejected under obviousness-type double patenting over claims 15-31 of copending Application No. 10/784,982.

Applicants respectfully disagree with this provisional rejection. However, in an effort to expedite prosecution of the subject application, Applicants intend to file a terminal disclaimer over Application No. 10/784,982 once allowed claims in Application No. 10/784,982 are identified.

9. Conclusion

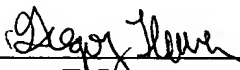
The foregoing amendments and remarks are being made to place the application in a condition for allowance. Applicants respectfully request reconsideration and the timely allowance of the pending claims. Should the Examiner find that an interview would be helpful

to further prosecution of this application, she is invited to telephone the undersigned at her convenience.

Except for issue fees payable under 37 C.F.R. 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or to credit any overpayment to Deposit Account 50-0310. This paragraph is intended to be a **Constructive Petition for Extension of Time** in accordance with 37 C.F.R. 1.136(a)(3).

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